

System Development Life Cycle (SDLC) of the US International Trade Commission

The use of an SDLC has been found, in general, to be an invaluable tool in the development of large and complex computing systems in both commercial and Federal environments. In addition to this there are specific reasons for the USITC to adopt an SDLC. Statute requirements of the Clinger-Cohen act, namely Section 5122." Capital Planning and Investment Control", subsection b.6 says:

"The process of an executive agency shall... provide the means for senior management personnel of the executive agency to obtain timely information regarding the progress of an investment in an information system, including a system of milestones for measuring progress, on an independently verifiable basis, in terms of cost, capability of the system to meet specified requirements, timeliness, and quality."

In addition, the audit by the Office of the Inspector General, Report No.OIG-AR-02-01 in Section C "Application Software Development and Program Change Controls" says:

"We identified one weakness within this FISCAM domain: ITC's change-control and Systems Development Life Cycle(SDLC) policies and procedures are undocumented. ITC does not have formal, written change-control policies that cover configuration management and SDLC to guide program offices in acquiring, developing, and maintaining commercial off-the-shelf software (COTS) products... OMB Circular A-130, Appendix III, requires agencies to plan for managing information throughout the life cycle of their system in an integrated manner. Agencies are required to consider effects of decisions and actions on other stages of the life cycle...NIST Special Publication No. 800-18 suggests agencies identify security requirements during system design and acquisition"

And in their recommendations in this same area the report says:

" We recommend that the Director, OIS, develop and implement an SDLC methodology and configuration management procedure, suitable to a small agency, to manage systems throughout their life cycles."

In response to this clear and unambiguous guidance, the OIS within the USITC has developed this SDLC which contains a Configuration Management Plan. All persons charged with managing projects within the USITC, whether employee or contractor, should be trained in this process. Contractors may request a waiver from the IRMSC at the point of seeking approval for a Project Proposal and Evaluation if they wish to use an alternative SDLC methodology provided that the alternative methodology is shown to be in widespread use and that it produces similar documents. The documents produced by the contractor's alternative SDLC should then be substituted at the key decision points outlined in this process.

Each project attempted by the USITC is expected to go through a series of phases which start with initial recognition of the need for a new system, and proceed to the end of the useful life of the system. These phases then break down into one or more stages. Each stage in the lifecycle presents unique challenges, and requires specific information to be gathered and communicated in order to answer those challenges. These phases and their component stages are listed here, with brief discussion of the events which are expected to transpire at each stage.

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A. Project Start-Up Phase

This phase covers all activities from the initial fuzzy concept of a system to the point at which actual system development and deployment is ready to begin.

1. Initiation Stage

This stage is meant to serve as the initial brainstorming portion of a project. This activity may be initiated by any employee, but should typically result from either a perceived business need by an operational department, or from discovery of an opportunity to utilize newly available technical capabilities to improve delivery of service. At this stage, documentation of a project is fairly light, and is utilized primarily to select those ideas which are most likely to be worth devoting a portion of the finite resources of the organization to pursuing. Governance of this stage would be accomplished through a committee of USITC management meeting as needed on an ad-hoc basis.

2. Justification and Approval Stage

This stage is meant to insure alignment of project initiatives with the strategic business goals of the agency, and to prioritize funding to assign resources to those projects which are of the highest priority. This stage incorporates the first risk assessment for a project, as well as the process for the review of IT investments, which is documented separately.

3. Commencement Stage

This stage is intended to make the transition from a newly funded activity to the point at which a project is actually being executed. For projects which will be undertaken using existing agency resources this stage will include activities such as requirements gathering, detailed system specification, development of acceptance criteria, bench-marking of current methods for later comparison, and development of detailed implementation plans and schedules. For programs which require procurement activities, this stage will additionally include the preparation of SOWs and RFPs, evaluation plans, the bid and proposal process, and vendor selection.

B. Project Performance Phase

This phase includes all activities from the start of system development and deployment through the point at which users are ready to begin actual use of the system for business purposes.

1. Execution Stage

This stage is intended to incorporate all those activities needed to implement and deploy an approved project. This includes actions such as inter-departmental coordination, the development of software, the deployment of hardware, installation, integration and user training.

2. Adjustment Stage

This stage is optional, and should only be required on large projects of long duration. After sufficient system implementation activities have been completed for users to assess the functionality being created or changed by a project, they may request a modification to the system design in order to accommodate desirable differences in system operation due to changes in business conditions, legislation, or technology. All changes must be covered in a change proposal which updates the documents produced in stage B-1. Any change which causes significant increases in project costs must obtain funding through the funding approval process outlined in stage A-2. Execution of project adjustments will then proceed as an extension to stage B-1.

3. Acceptance Stage

During this stage both the components created and deployed by a project, as well as the business functionality embodied in the project will be subject to validation. The technical parameters of the system will be verified using acceptance testing criteria and plans developed in stage B-1. Any significant discrepancies must be either corrected or deemed acceptable by the client organization . All system documentation and configuration information will be verified as correct.

C. Project Conclusion Phase

This phase covers all activities from the point at which users begin to employ a system for business purposes, until the end of system life.

1.Evaluation Stage

This stage begins with the end of system acceptance testing, and continues as long as is necessary to determine whether budgetary assumptions given in the justification for this system were accurate. Data gathered is used to provide feedback to the process of system design and specification, as well as the scheduling and budgetary functions. A first report, prepared 30-90 days after system acceptance, details variances between projected and actual cost, schedule and functionality. In addition the reviewers will prepare a plan which identifies those discrepancies which can be corrected in future projects, and outlines steps which will be taken to improve and correct the methods used for estimation. A second report, prepared each year after acceptance testing, will detail variances between projected and actual operating expenses and cost savings. This report will track the usefulness and value of this project as an IT investment, and provide feedback to IT strategic planning. In addition the reviewers will prepare a plan which identifies those discrepancies which can be corrected in future projects, and outlines steps which will be taken to improve and correct the methods used for estimation.

2. Maintenance Stage

This stage also begins immediately after acceptance testing and covers all activities associated with bug fixes, version control, and updates. During this stage the system operation will be tracked and managed by a selected group responsible for system maintenance. Reported errors and their resolution will be tracked and system status will be reported.

3. Termination Stage

This stage covers the activities necessary to decommission a system. A termination plan will be prepared which covers issues such as archiving of sensitive data, disconnection of interfaces to other systems, and replacement tools for business functions still dependent on this system. Execution of this plan will be considered the final portion of the SDLC for this system.

The version of this plan as last reviewed by the TRC (a new version is under heavy construction) can be downloaded here in:

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